

FIG. 1

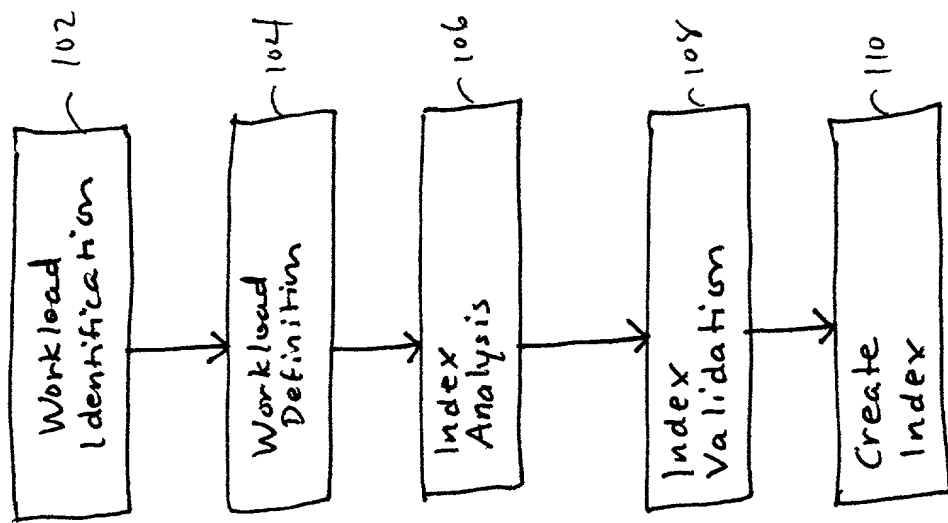


FIG. 2

Patent 8,604,550

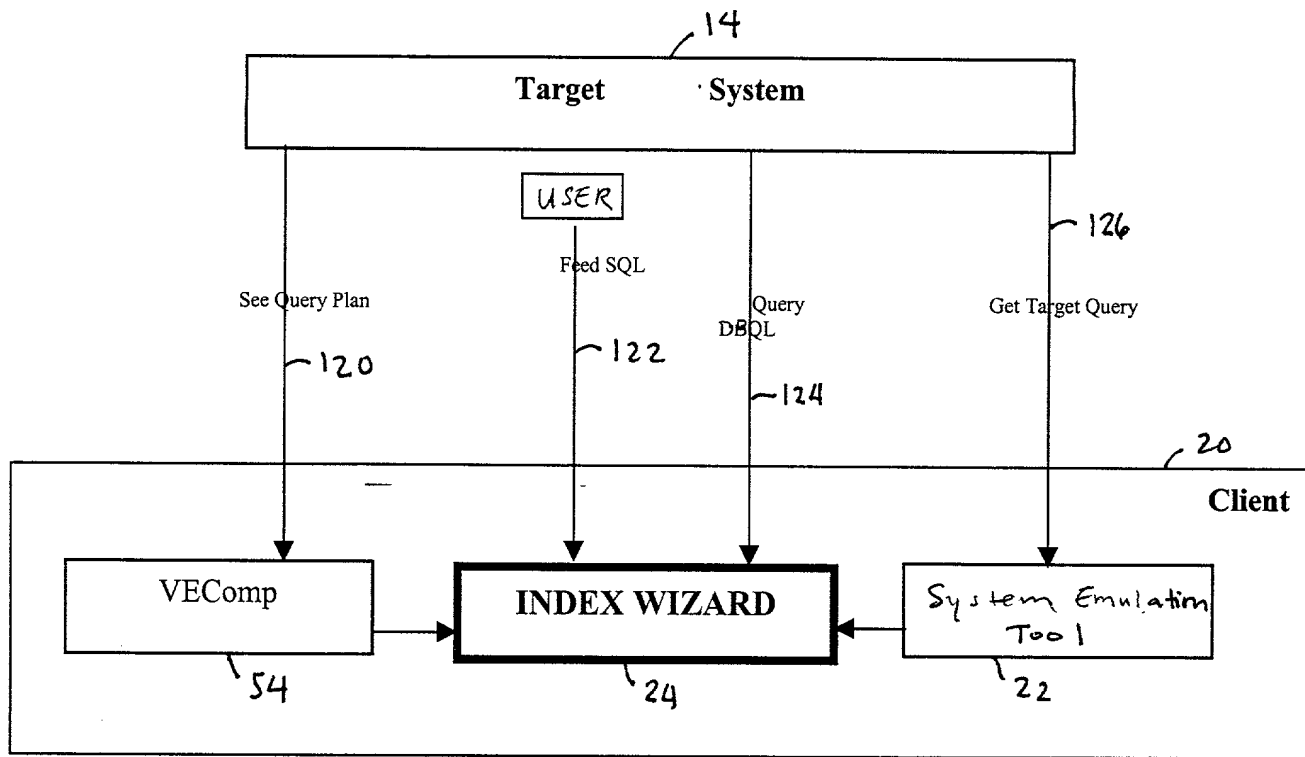


FIG. 3

0597038-101204

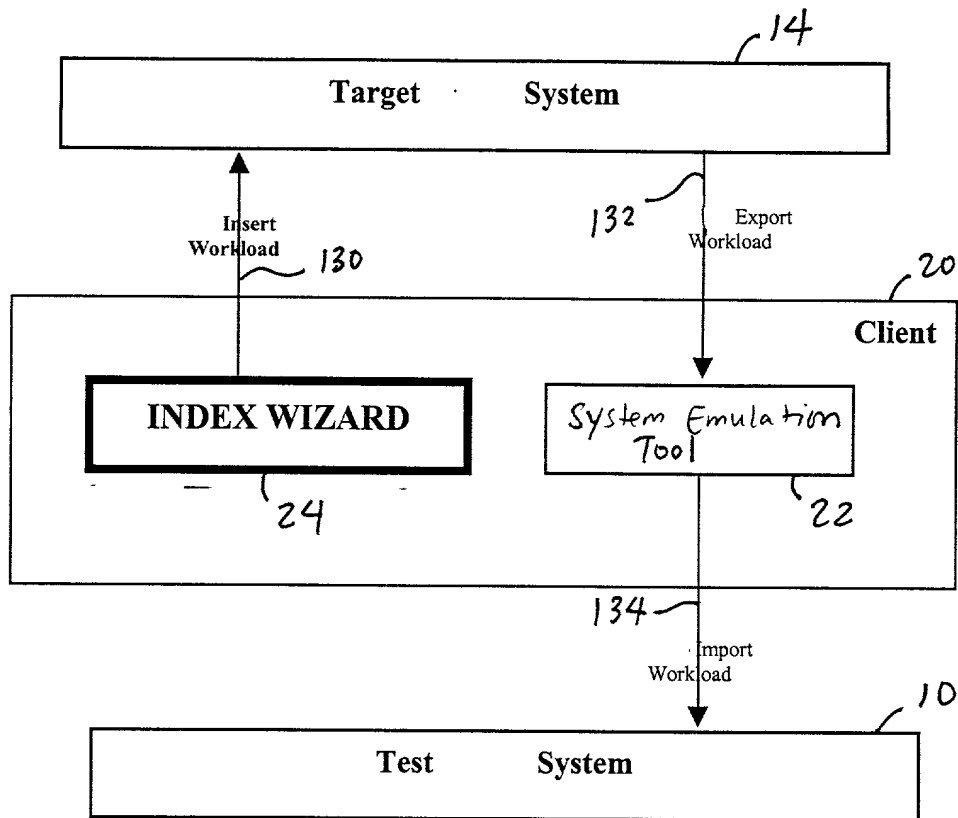


FIG. 4

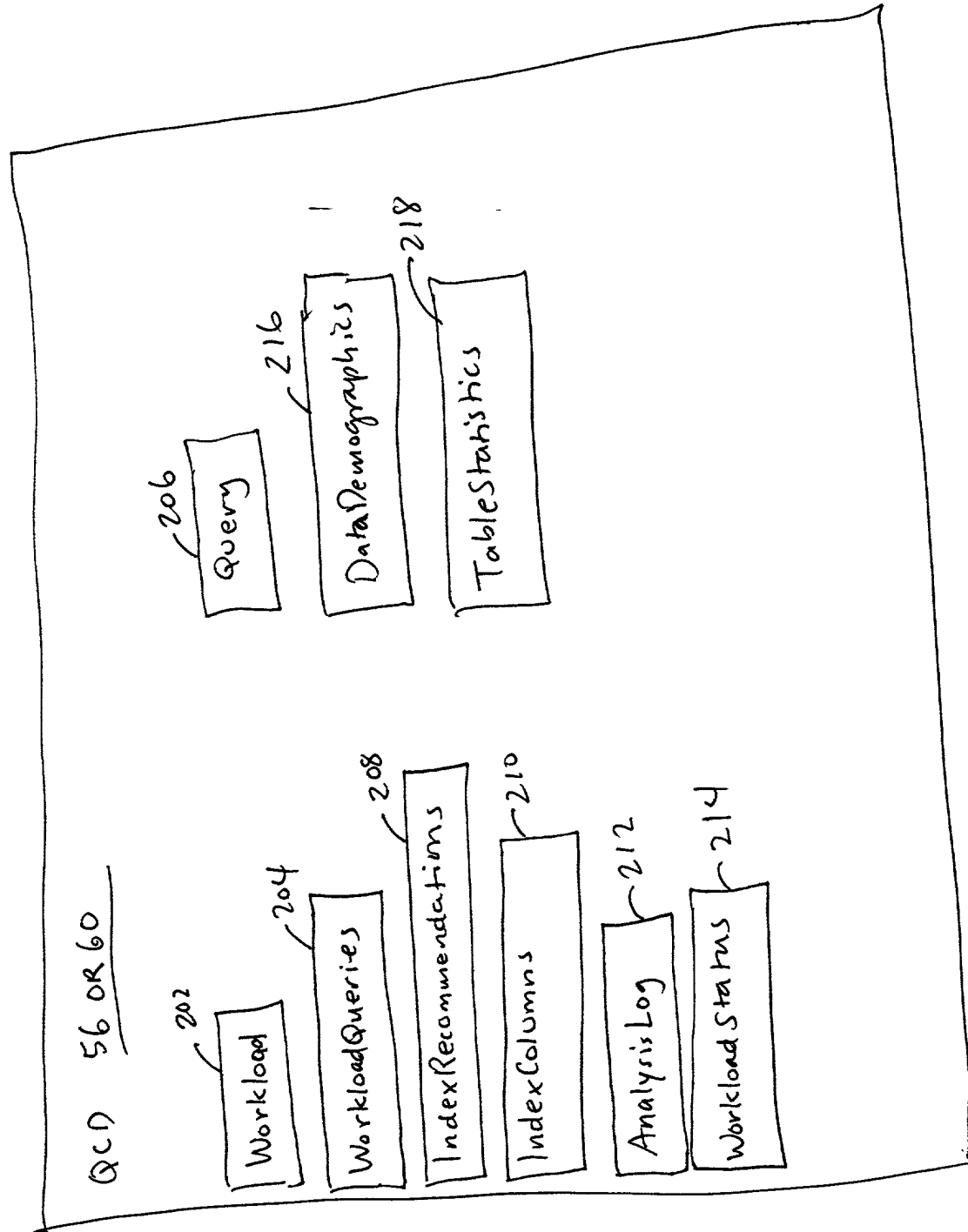


FIG. 5

```

graph TD
    subgraph Target_System [Target System 14]
        TS[Target System]
    end
    subgraph Client [Client 20]
        IW[INDEX WIZARD 24]
        SET[System Emulation Tool 22]
        IW --> SET
    end
    subgraph Test_System [Test System 10]
        TS2[Test System]
    end

    TS -- "Get Index Recommendations 135A" --> IW
    TS -- "Get Target Data 136" --> SET
    IW -- "Initiate Index Analysis 139" --> TS2
    TS2 -- "Get Index Recommendations 135B" --> IW
    SET -- "Emulate Production system 138" --> TS2
  
```

FIG. 6

05977038 40404

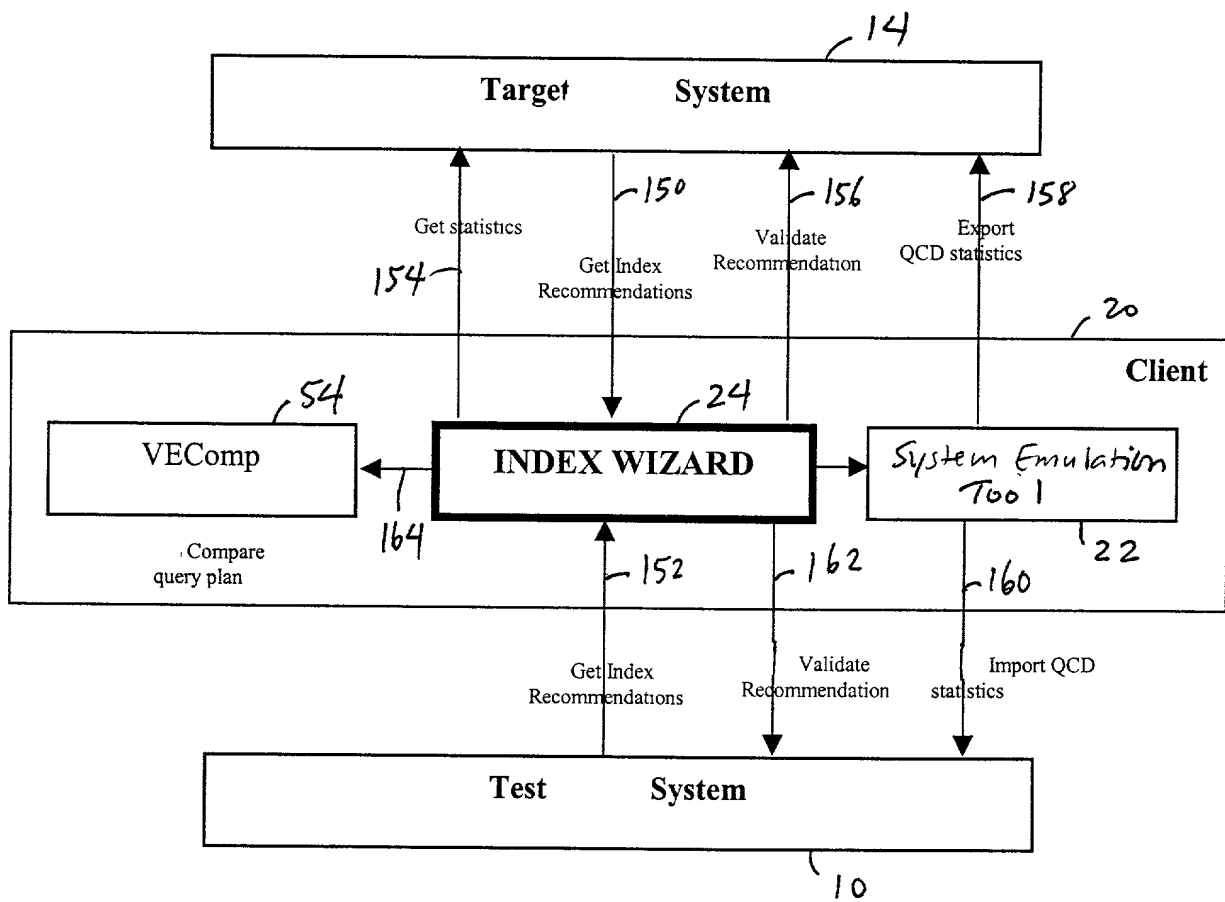


FIG. 7

0997038 404204

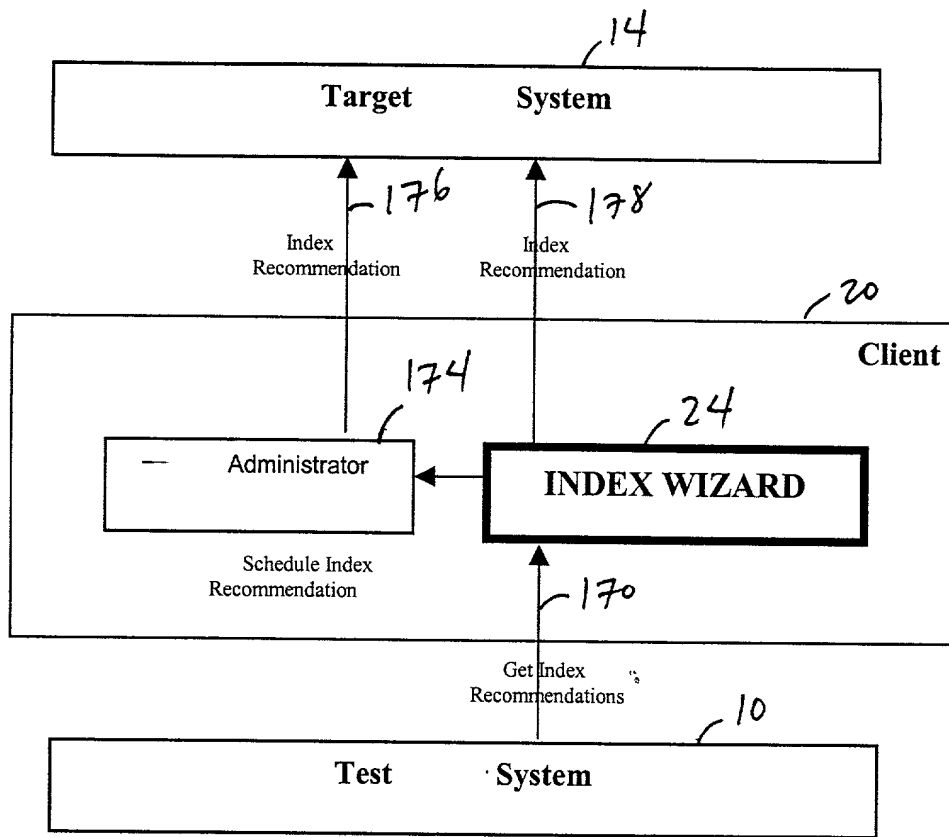
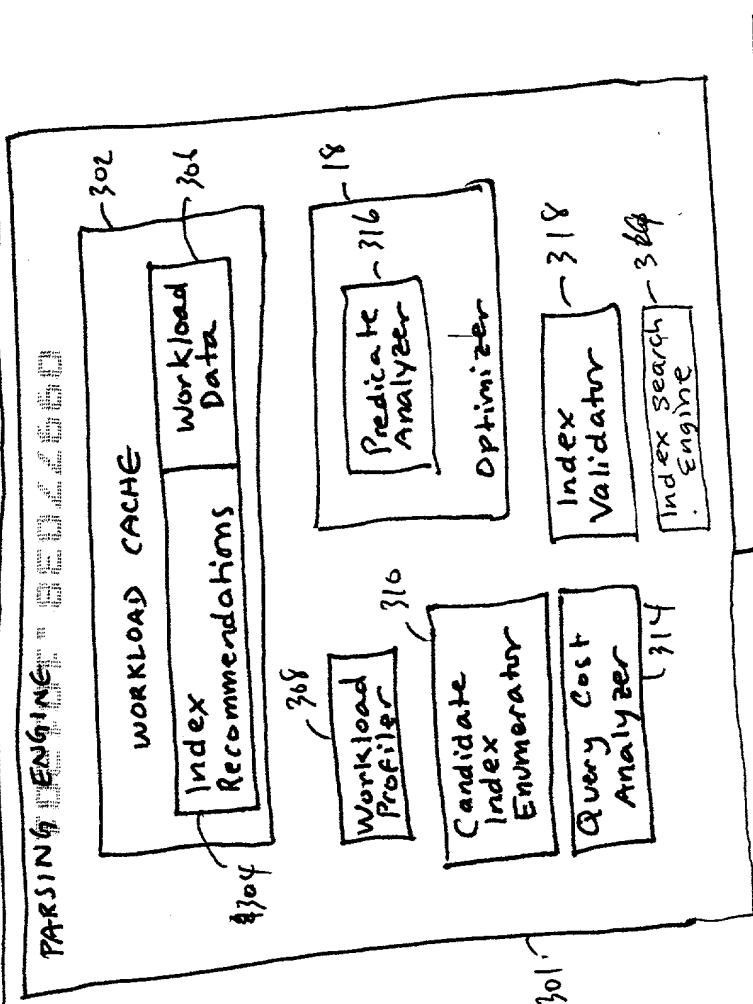


FIG. 8

DB SYSTEM 300

PARSING ENGINE 302



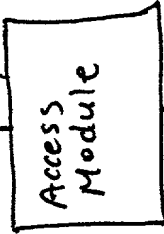
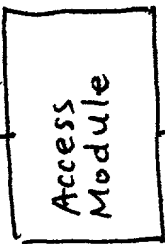
320

INTERCONNECT LAYER

322

322

322



...



FIG. 9

Select Initial Population 352

Compute Fitness of Members of Current Population 354

Apply Reproduction Operator 356

Apply Crossover Operator 358

Apply Mutation Operator 360

Compute Fitness of Members of New Population 362

Check for Termination Condition 364

FIG. 10

09977038 101201

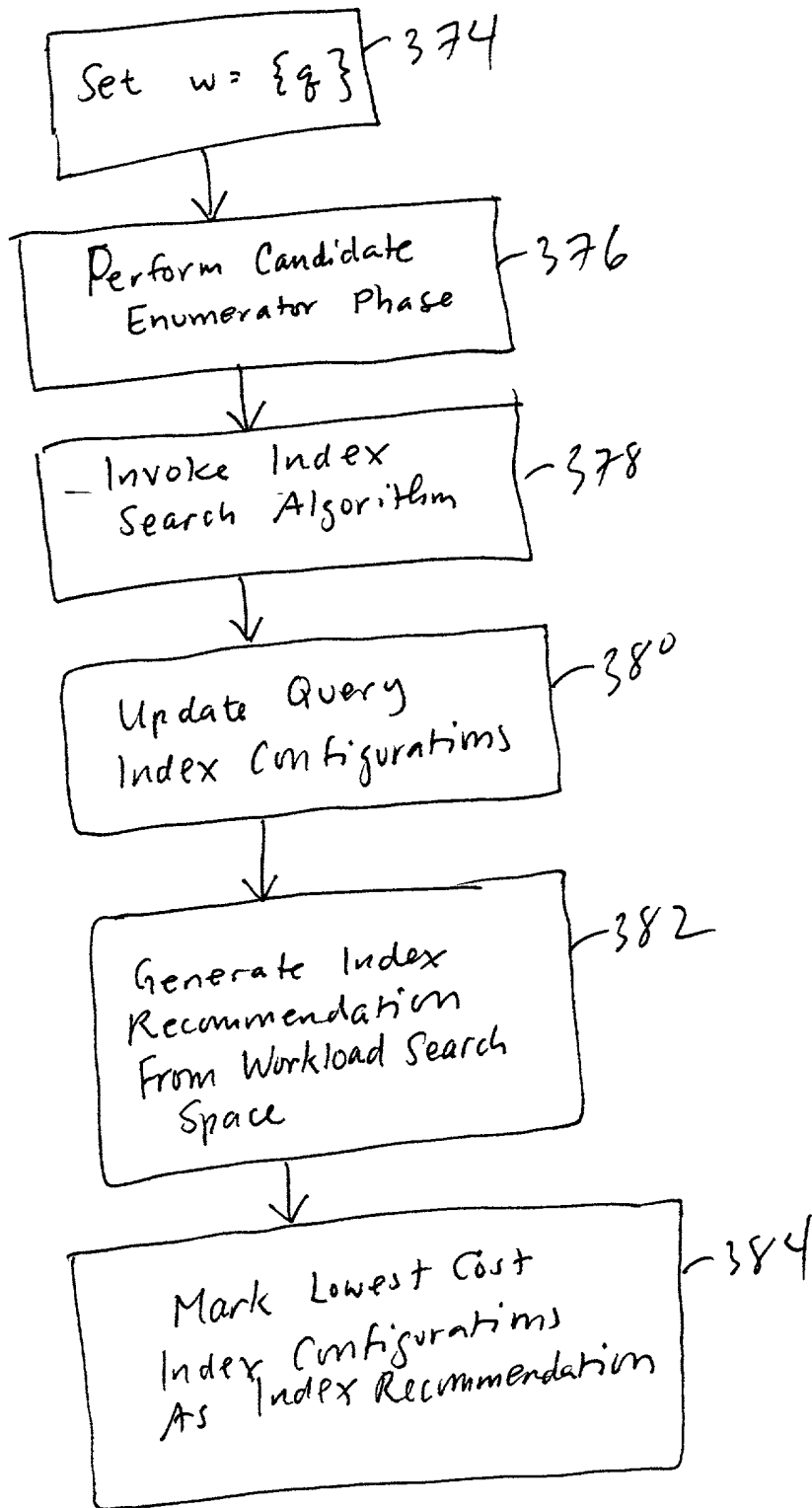


Fig. 11

0997038 100

400

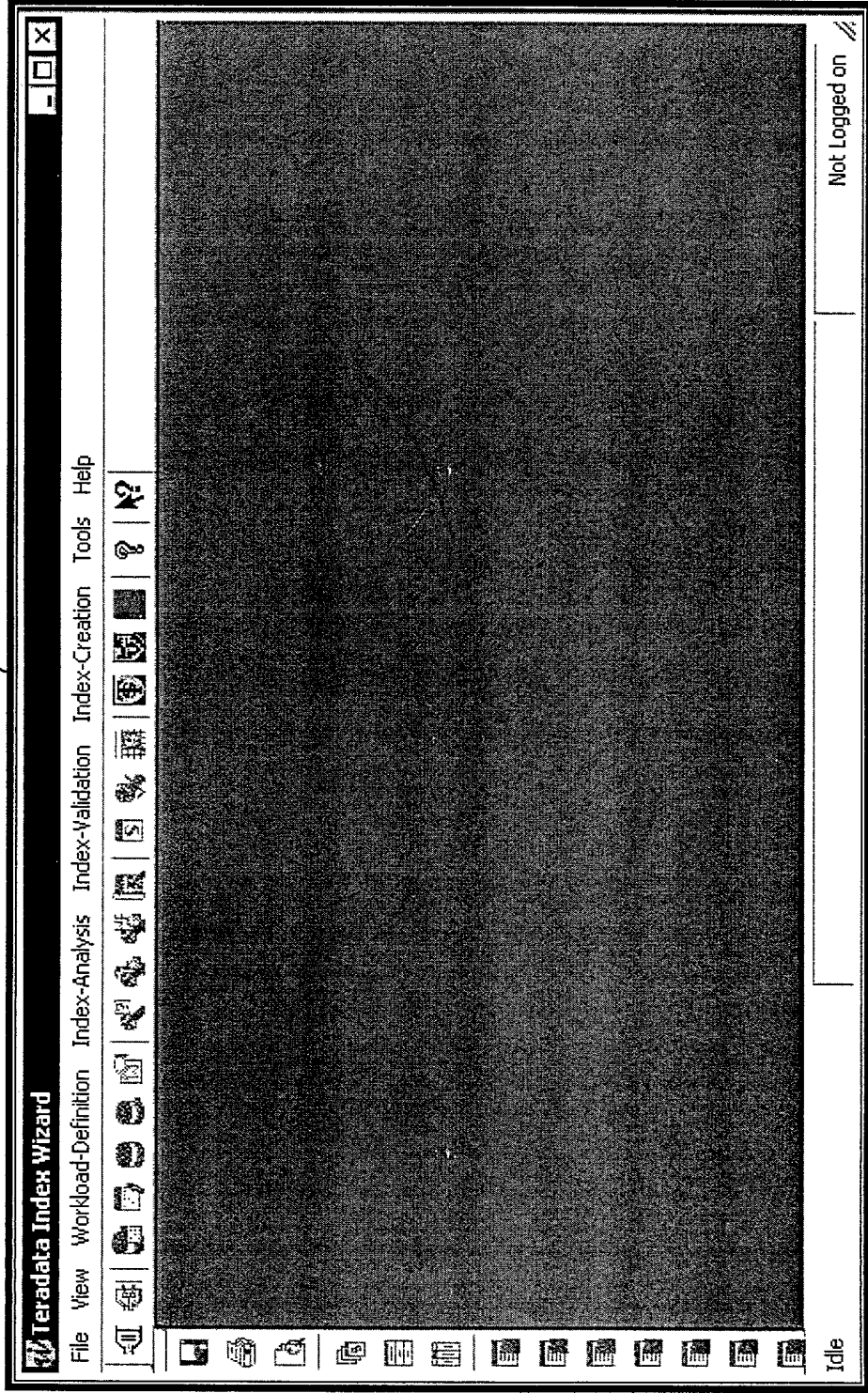
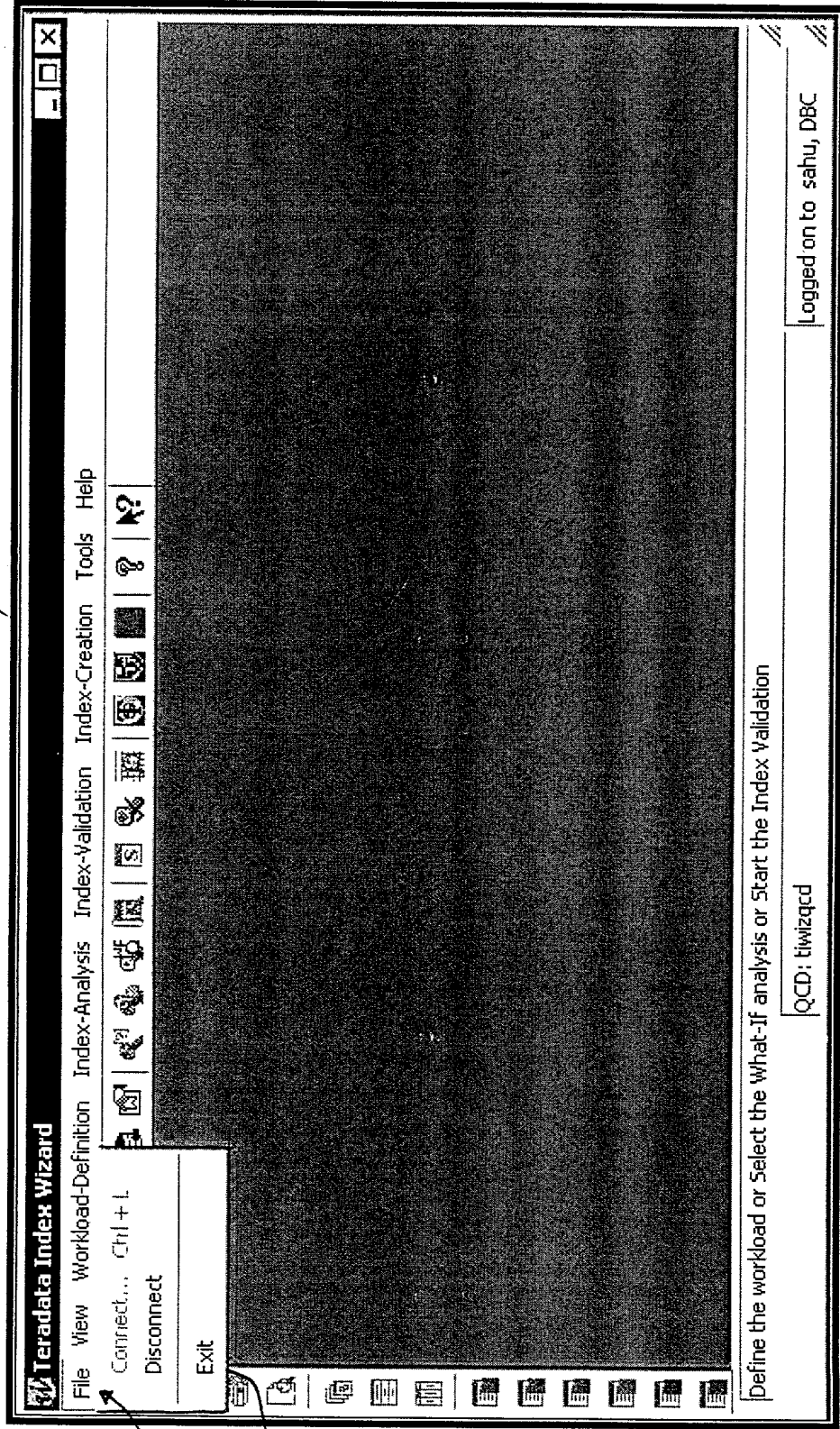


FIG. 12

FOOT" BED 22660

406



402

404

FIG. 13

REPORT "8604658"

400

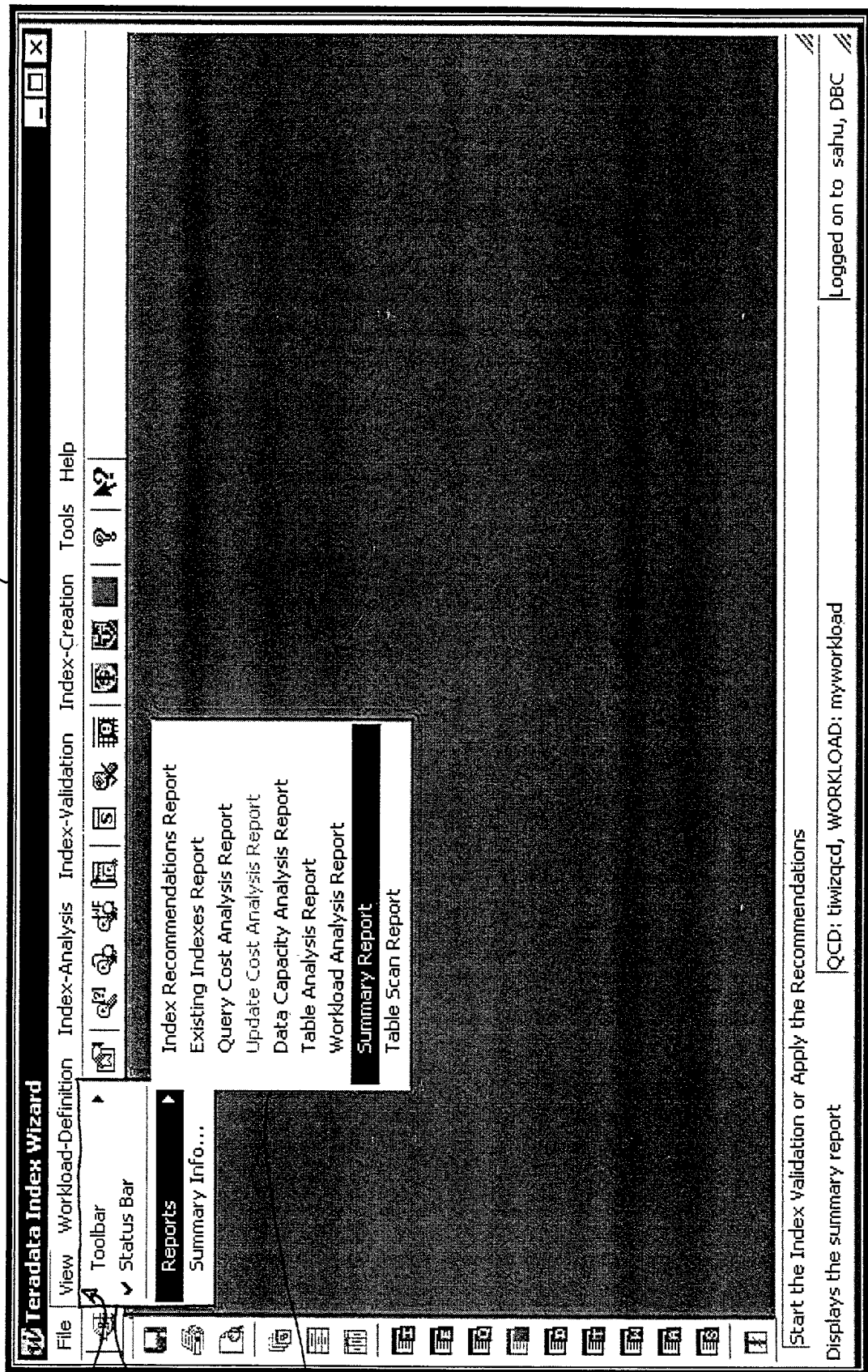
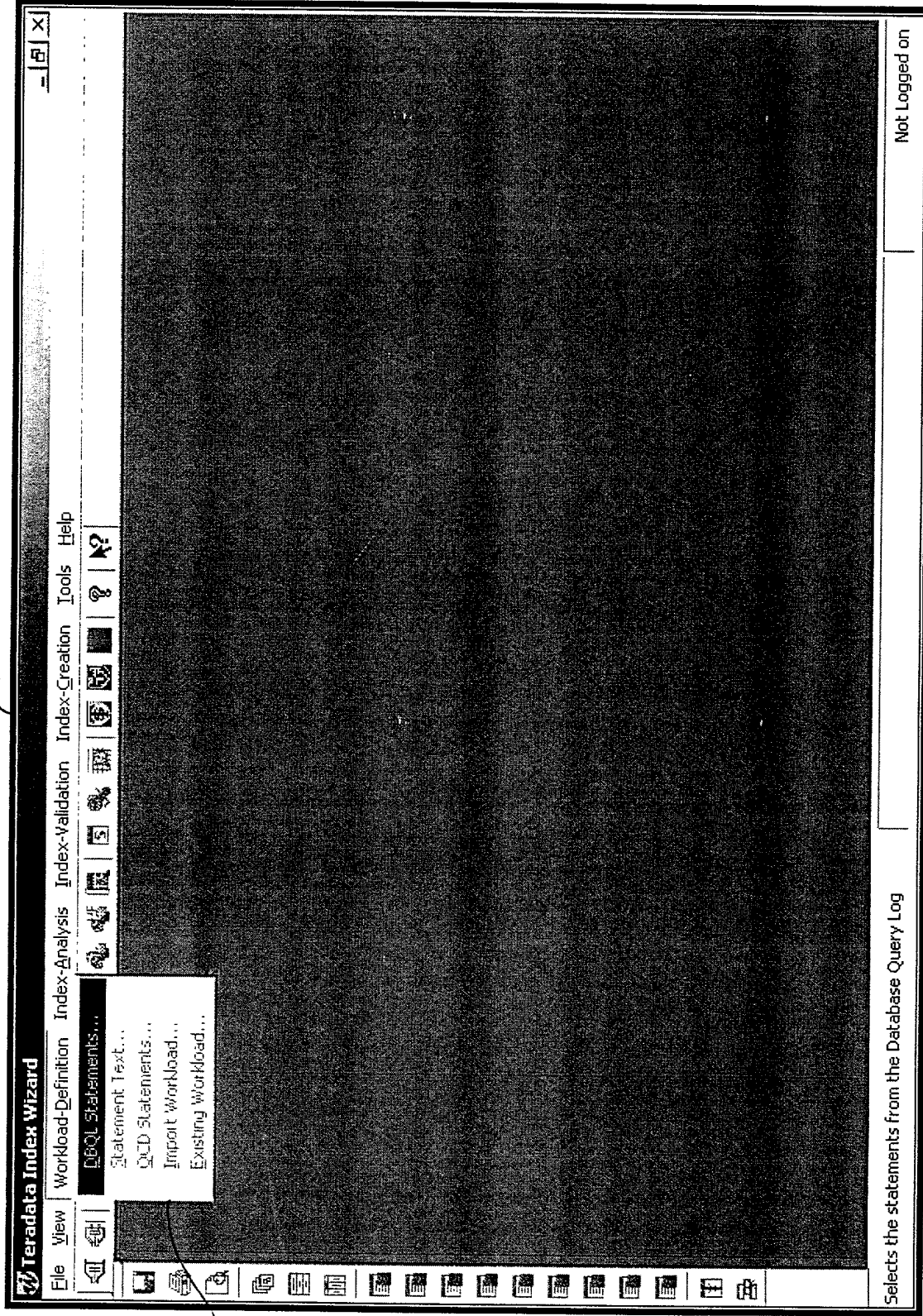


Fig. 14

TOPIC: 8802/660

420

400



422

Fig. 15

TOTAL REO/660

432

430

400

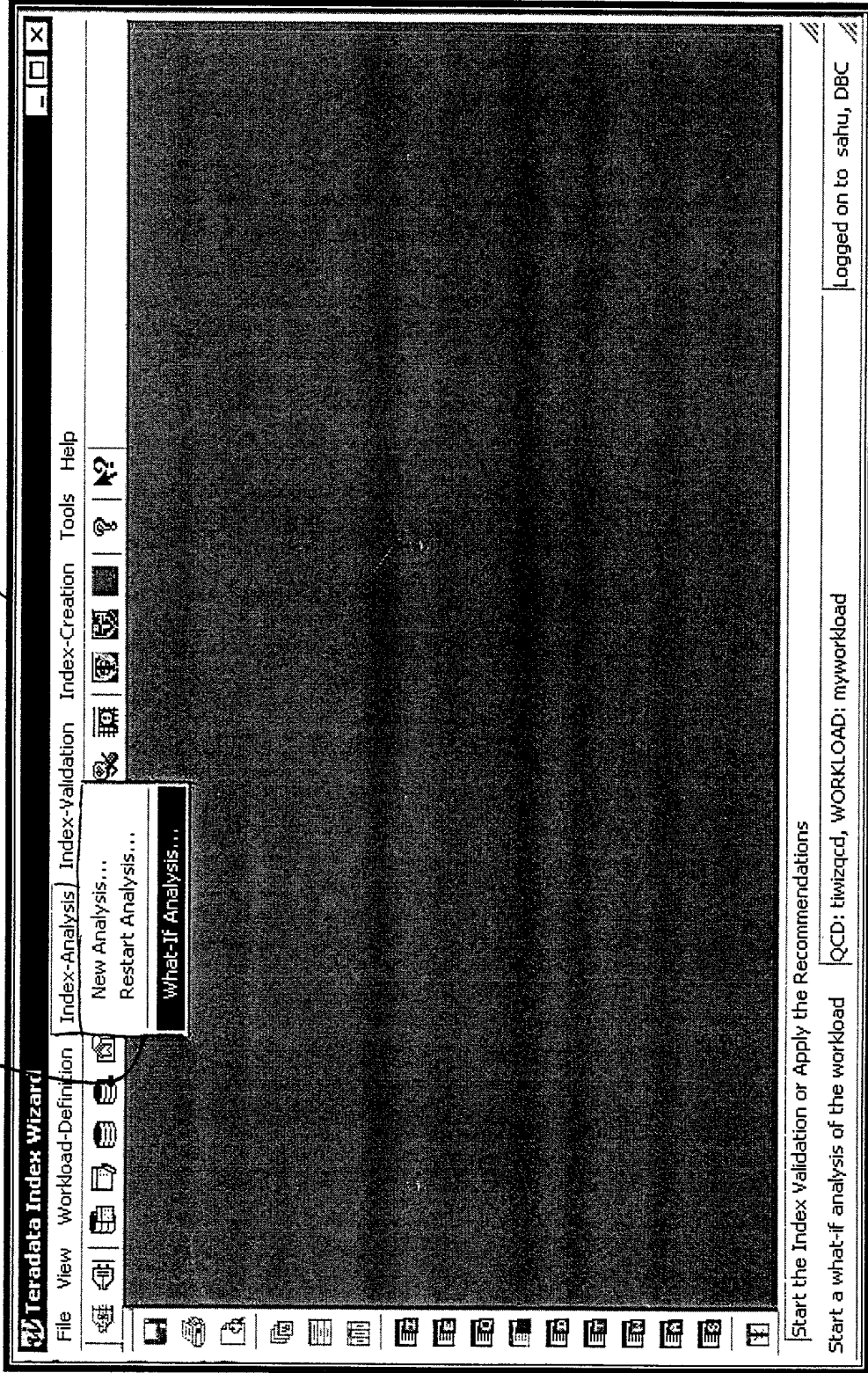


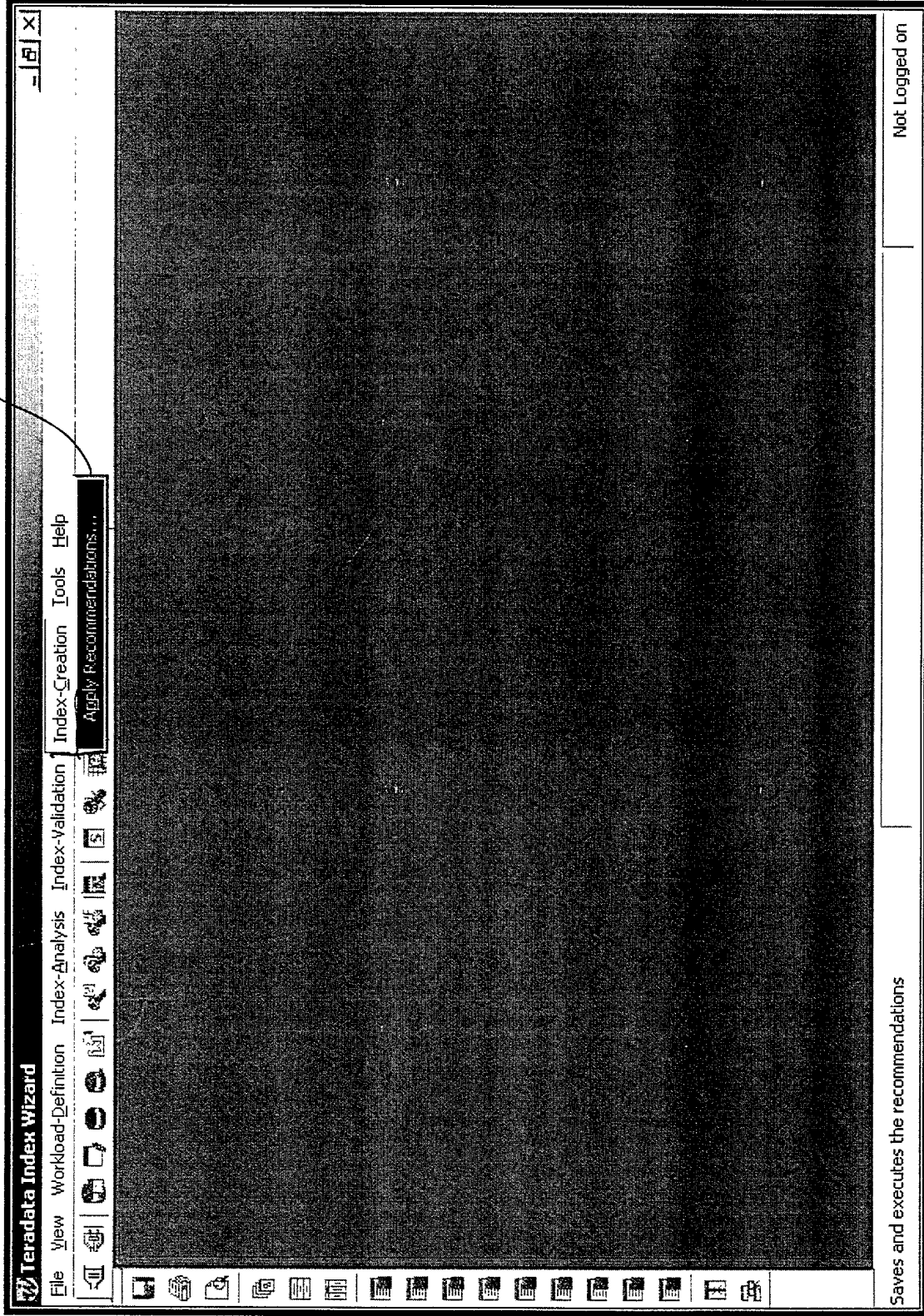
Fig. 16

442 440 400
↑ ↓



Fig. 17

7.02.07 09:04:00
450
✓



Flh. 18

TPC-H "000/0000"

462

460

400

464

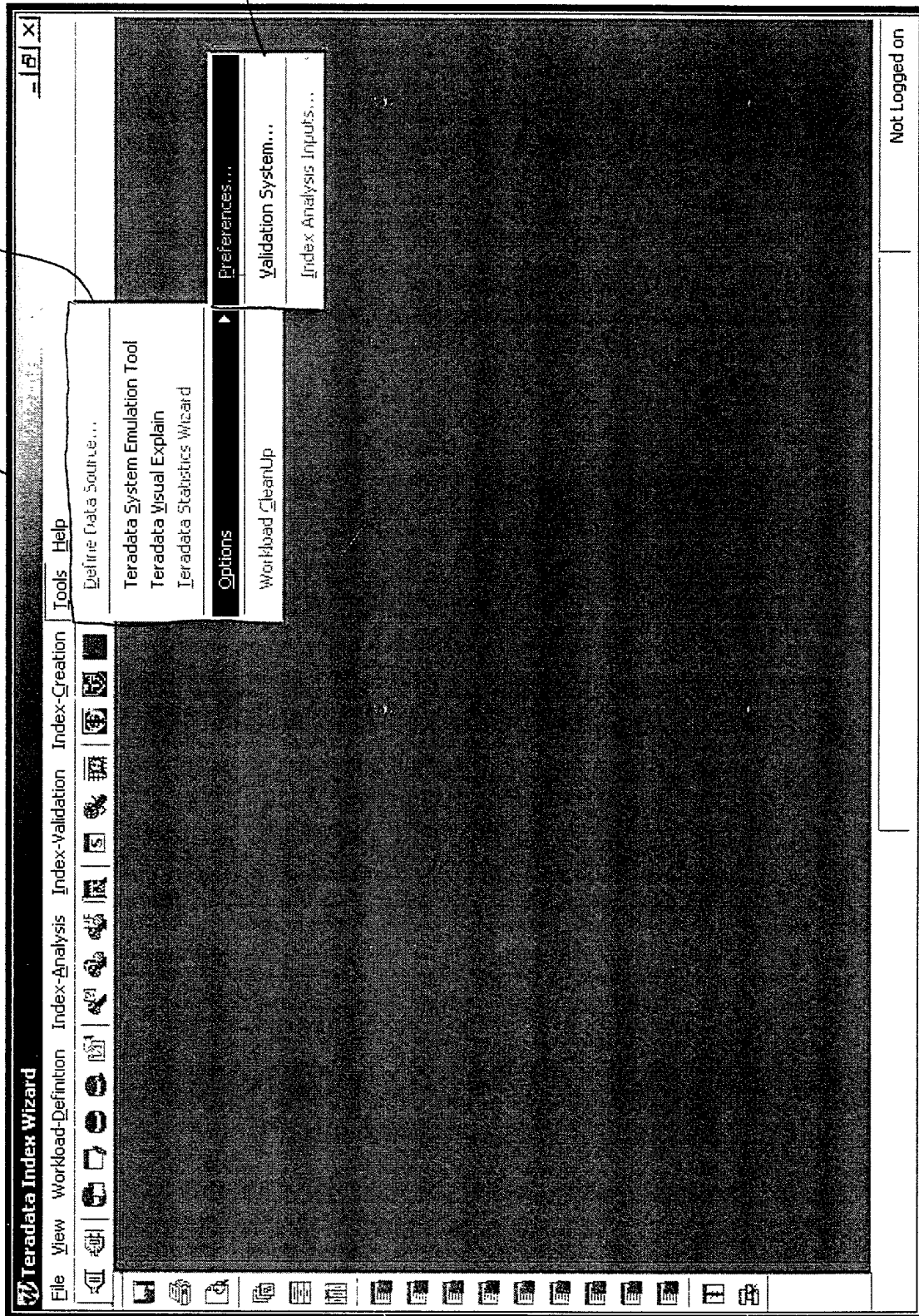


Fig. 19

Icon	Description
	To logon to the Teradata RDBMS server.
	To log off from the Teradata RDBMS server.
	To select the statements from the DBQL.
	To enter the SQL statements or select them from more than one file.
	To select the SQL statements from the QCD.
	To import a workload from a production system.
	To select an existing workload.
	To set/reset the index analysis parameters.
	To start index analysis.
	To perform "What-If" analysis
	To restart index analysis from a checkpoint.
	To display summary information.
	To validate the indexes.
	To schedule the creation of indexes.
	To view the help contents.
	To guide the user how to use help.

800-350
 301 352
 302 354
 803
 804
 805
 806
 807
 808
 809
 810
 811
 812
 813
 814
 815

Fig. 20

Define Workload ? | X

DBQL Search Criteria

User Name: Account Name:

Start Time: End Time:

Row Count: I/O Count: Frequency:

Statement Text:

DBQL Statements

Selected	Frequency	Statement Text
<input checked="" type="checkbox"/>		

Workload Name:

500

503

502

Define Workload

SQL Statements

sel * from dbc.dbcinfoTbl;

S12

Frequency: 1

S13

Add

Browse...

Selected Statements

Workload Name: MyWorkload

Frequency	Statement Text
1	sel * from dbc.dbcinfoTbl;

Remove

OK

Cancel

FIG. 22

Define Workload

QCD Statements

QCD Name: TIWizQCD

Query ID:

Query Tag:

Browse QCD

Selec	Query	Frequ	Statement Text
<input checked="" type="checkbox"/>	19	1	Insert explain into tiwizqcd sel * from query,rel
<input checked="" type="checkbox"/>	17	1	Insert explain into tiwizqcd sel * from query...
<input type="checkbox"/>	15	1	sel * from query,relation where query.queryid =
<input checked="" type="checkbox"/>	13	1	sel * from query,relation ,workload ...
<input type="checkbox"/>	32	1	sel * from query,relation where relation.relation
<input checked="" type="checkbox"/>	11	1	sel * from query,relation where query.queryid =
<input checked="" type="checkbox"/>	9	1	sel * from query,relation ,workload where quer
<input type="checkbox"/>	30	1	sel * from query...
<input type="checkbox"/>	28	1	Insert explain into TIWizQCD sel * from relation

Workload Name: MyWorkload

Select All

Deselect All

OK

Cancel

Fig. 23

Open

?

x

Look in:

sql

▼

⬅

➡

📁

🔍

createdb

createtb

dropdb

migrat10

migrat11

migrat20

migrat21

migrat30

migrat31

migrat40

migrat41

migrat42

File name:

createtb

Open

Files of type:

SQL Files (*.sql)

▼

Cancel

-530

Fig. 24

Define Workload

?

X

Select SQL Statements

Selected	Frequency	Statement Text
<input checked="" type="checkbox"/>	1	SELECT DISTINCT t2.t2_c2 - t
<input type="checkbox"/>	1	SELECT NULLIF(t4.t4_c3 ,
<input checked="" type="checkbox"/>	1	DELETE FROM t4 WHERE NO
<input checked="" type="checkbox"/>	1	DELETE t1 WHERE NULLIF(t1
<input type="checkbox"/>	1	INSERT INTO t2 (t2.t2_c1, t2.
<input checked="" type="checkbox"/>	1	UPDATE t1 FROM t5.t2.t3 SET

Workload Name: MyWorkload

Select All

Deselect All

OK

Cancel

540

542

Fig. 25

Existing Workload

Workload Statements

QCD Name:

TWizQCD

...

Workload Name:

MyWorkload

Stater	Frequ	Statement Text
1	1	sel * from query.;
2	1	sel * from relation.;

Workload Status

Recommenc	Index Tag	Validated S ₃	Validated T ₁₁	Validated Q ₁	Recom
2	myindextag	deepika	7:43.670000	twizqcd	NONE
1	MyIndexTag	deepika	7:43.670000	twizqcd	NONE
2	myindextag	deepika	7:43.670000	twizqcd	NONE

Modify Options

☐ Qcd Statements

☐ Query Text

Modify

OK

Cancel

Fig. 26

Existing Workload

Workload Statements

QCD Name:

TWizQCD

...

Workload Name:

MyWorkload

Selec	Statel	Frequ	Statement Text
<input checked="" type="checkbox"/>	1	1	sel * from query::
<input type="checkbox"/>	2	1	sel * from relation::

Workload Status

Recommen	Index Tag	Validated S _y	Validated T _{ii}	Validated Q _t	Recom
2	myindextag	deepika	7.43.670000	tiwizqcd	NONE
1	MyIndexTag	deepika	7.43.670000	tiwizqcd	NONE
2	myindextag	deepika	7.43.670000	tiwizqcd	NONE

Modify Options

☐ Qcd Statements
 ☐ Query Text

New Workload Name:

Update

OK

Cancel

FIG. 27

Index Analysis Parameters

?
X

Index Analysis Inputs

☒ Kee existing indexes

Maximum Columns per Index:

Maximum Indexes per Table:

Index Search Space:

Change Rate Threshold:

4

16

256

5

OK

Set Defaults

Cancel

-560

Fig. 28

Index Analysis

Workload Statements

Statement Id	Frequency	Statement Text
3	1	sel * from query,relation where relation.relationid
1	1	sel * from query::
2	1	sel * from relation::

Select Tables

Selected	Database Name	Table Name	Access [
<input checked="" type="checkbox"/>	tiwizqcd	QUERY	3
<input checked="" type="checkbox"/>	tiwizqcd	RELATION	2

Restart Parameters

Index Tag: MyIndexTag

Checkpoint Frequency:

Save Options

☐ Save Recommendations in Files
 ☐ Save Execution Plans in Files

OK

Cancel

FIG. 29

Restart Index Analysis

?

X

Restart parameters

QCD Name: TIWizQCD

Workload Name: MyWorkload

Index Tag: MyIndexTag

Save option

☒ Save Recommendations

☐ Save execution plans

OK

Cancel

-580

Fig. 30

What-If Analysis

Workload Details

QCD Name:

tiwizqcd

Workload Name:

MyWorkload

Index Tag:

MyIndextag

Statement

Frequency

Statement Text

1	1	sel * from query;;
2	1	sel * from relation;;
3	1	sel * from query,relation where relation.relationid = query.

View Recom...

View Report...

Analysis

DDL Text:

CREATE INDEX index_5 (TableName) on Relation;

Selected DDL Statements:

Statement Text

COLLECT STATS Relation INDEX index_5

CREATE INDEX index_5 (TableName) on Relation

COLLECT STATS Relation INDEX index_5

CREATE INDEX index_5 (TableName) on Relation

Add ->

Rem

Rem All

Browse...

View Graph

Analyze

Conclusion : An overall improvement of 31.34 in the performance of the system

OK

Compare...

Cancel

594

596

590

602

604

592

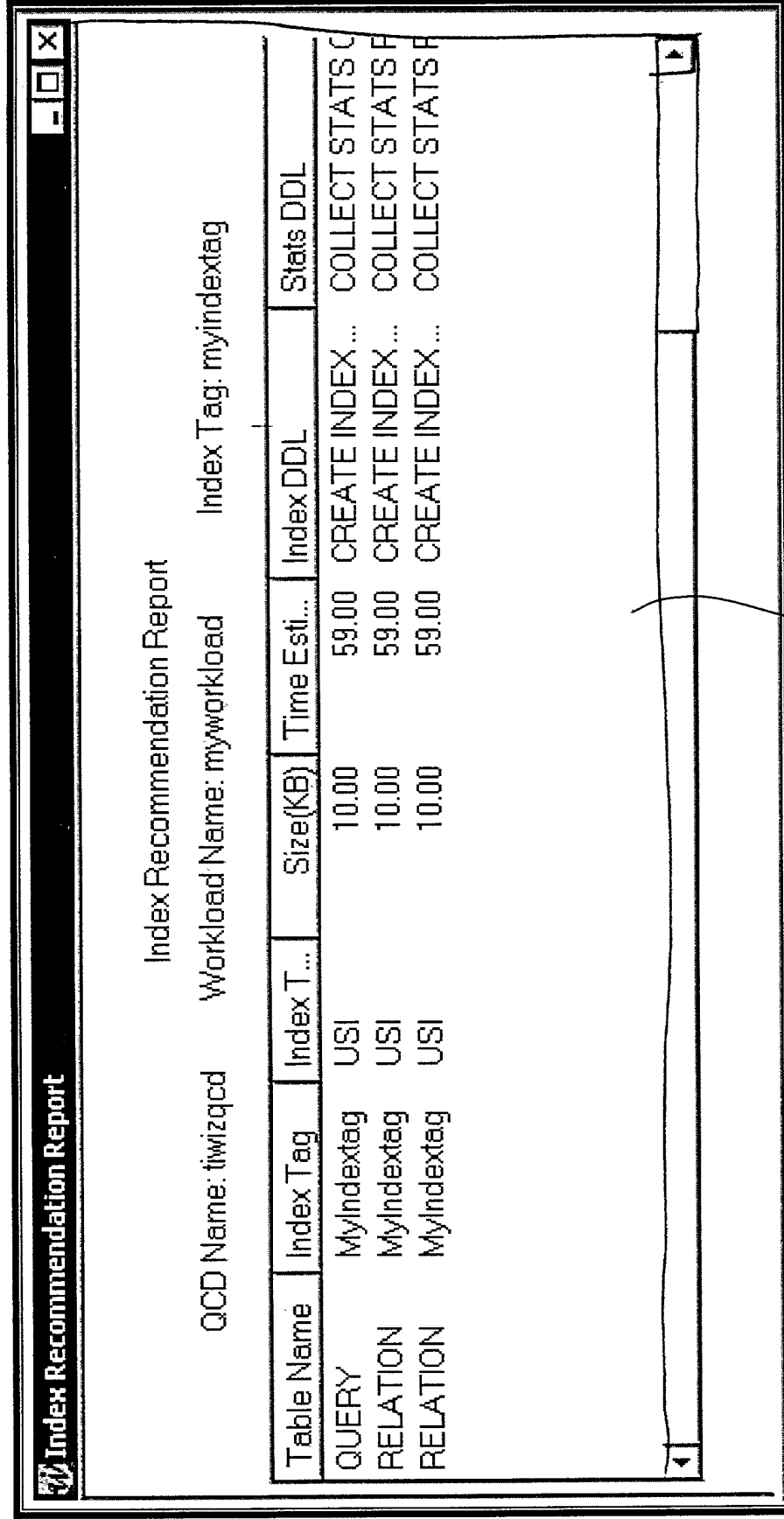
598

606

608

31

Fig.



622

FIG. 32

Existing Indexes Report

-|0|x|

Existing Indexes Report

QCD Name: TIWizQCD Workload Name: myworkload Index Tag: MyIndexTag

Table Name	Index Name	Index Type	Columns
QUERY	PK_QueryID	P	QueryID
RELATION	PK_RelationKey	P	RelationKey

630 632

Query Cost Analysis Report

Query Cost Analysis Report

QCD Name: TIWizQCD Workload Name: myworkload Index Tag: MyIndexTag

Query Type	Cost(with existing i...	Cost(with recommended...	Percentage! Cha...	Query Text
SELECT	100.00	50.00	100.00	sel * from query, relation w
SELECT	100.00	50.00	100.00	sel * from query,;
SELECT	100.00	50.00	100.00	sel * from relation,;



Fig. 34

Update Cost Report

Update Cost Report

QCD Name: MyTextQCD

Workload Name: MyWorkload

Index Tag: Index1

Table Name	Indexes	Update Cost
No rows returned		

650

652

FIG. 35

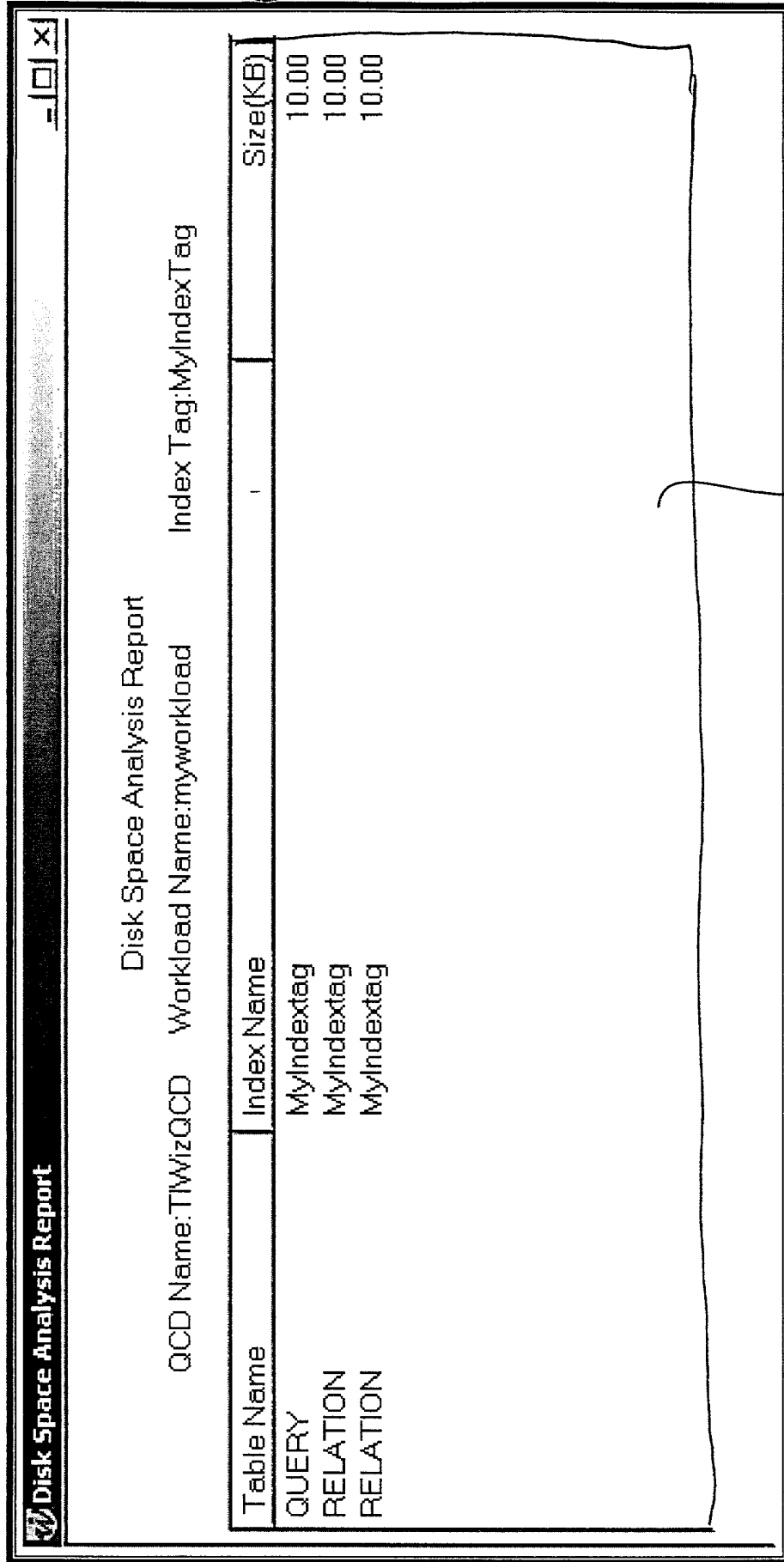


FIG. 36

Table Usage Report

[-] [] [X]

Table Usage Report

QCD Name: TIWizQCD Workload Name: myworkload Index Tag: MyIndexTag

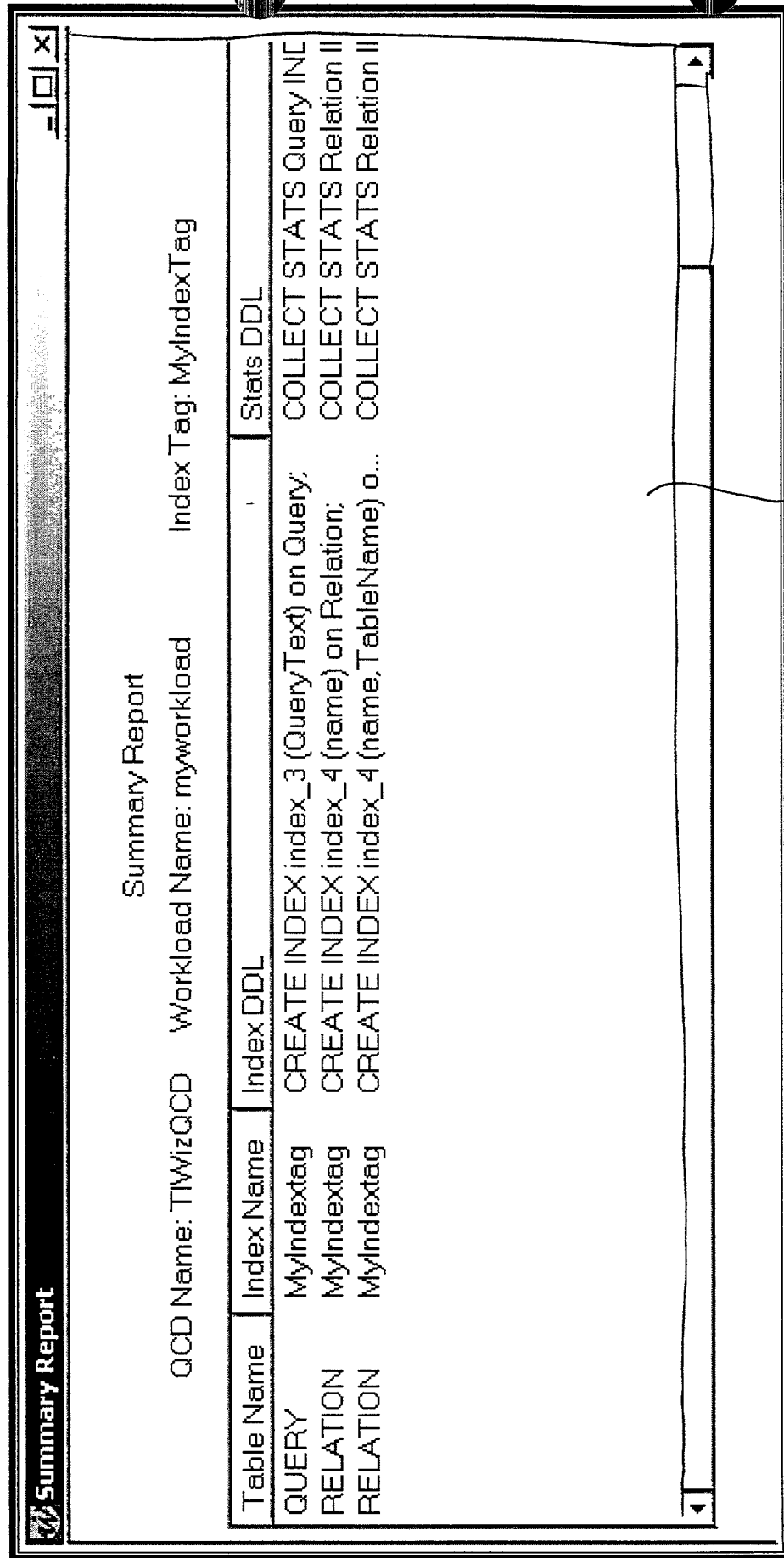
Table Name	Access Count	Statement Text
QUERY	1	sel * from query.relation where relation.relationid = query.queryid and query.qu
RELATION	1	sel * from query.relation where relation.relationid = query.queryid and query.qu
QUERY	1	sel * from query::
RELATION	1	sel * from relation::

File, 37

670 672

F16. 38

680 682



690 692

Fig. 39

Table Scan Report

Table Scan Report

QCD Name: tiwizqcd Workload Name: myworkload

Owner	Table Name	Cardinality	AMPs Retrieve's...	Geograph...	Statement Text
tiwizqcd	QUERY	45.00	All AMP Retrieve	built locally	sel * from query,relation where query.que
tiwizqcd	QUERY	45.00	All AMP Retrieve	built locally	sel * from query,relation ,workload where
tiwizqcd	QUERY	45.00	All AMP Retrieve	built locally	sel * from query,relation ,workload ;
tiwizqcd	RELATION	282.00	All AMP Retrieve	built locally	sel * from query,relation where query.que
tiwizqcd	RELATION	282.00	All AMP Retrieve	built locally	sel * from query,relation ,workload where
tiwizqcd	RELATION	282.00	All AMP Retrieve	built locally	sel * from query,relation ,workload ;
tiwizqcd	WORKLOAD	2.00	Single AMP Retr...	built locally	sel * from query,relation ,workload where
tiwizqcd	WORKLOAD	2.00	All AMP Retrieve	built locally	sel * from query,relation ,workload ;

Fig. 40

700

702

Workload Clean Up

?

X

Workload Statements

QCD Name:

TIWizQCD

...

Workload Name:

MyWorkload

▼

State	Frequ	Statement Text
1	1	sel * from query;
2	1	sel * from relation;

Workload Status

Selec	Recommen	Index Tag	Validated S _y	Validated T _{ij}	Validated Q _i
<input checked="" type="checkbox"/>	2	myindextag	deepika	7:43:670000	tiwizqcd
<input checked="" type="checkbox"/>	1	MyIndexTag	deepika	7:43:670000	tiwizqcd
<input checked="" type="checkbox"/>	2	multiindextag	deepika	7:43:670000	tiwizqcd

Delete Options

☐ Delete Workload
 ☒ Delete Analysis

☐ Delete Plans

Delete

OK

Cancel

710

712

714

F16. 41

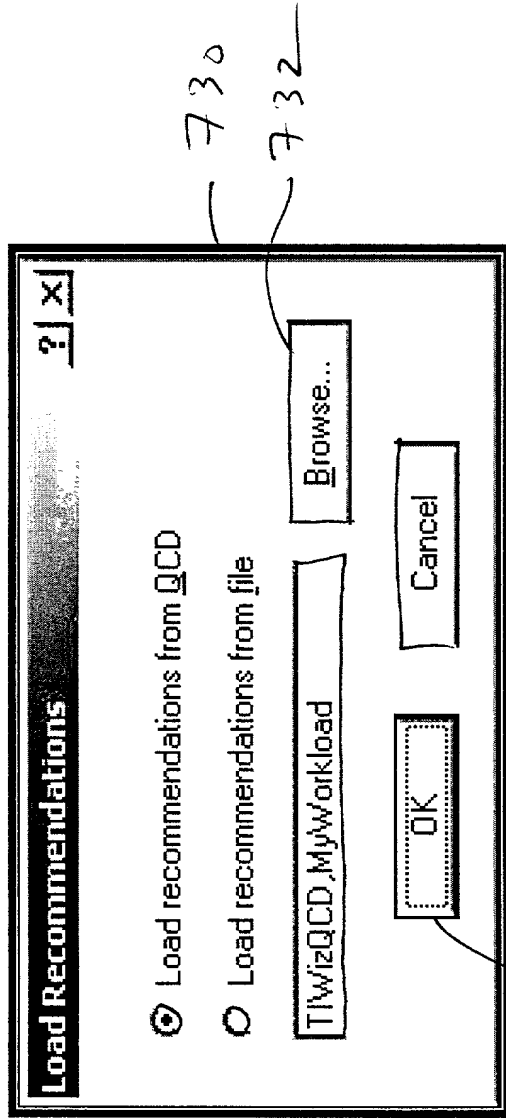


FIG. 10

Load Recommendations Details

?

X

QCD Name:

TIWizQCD

Workload Name:

MyWorkload

Index Tag:

myindextag

OK

Cancel

740

742

FIG. 43

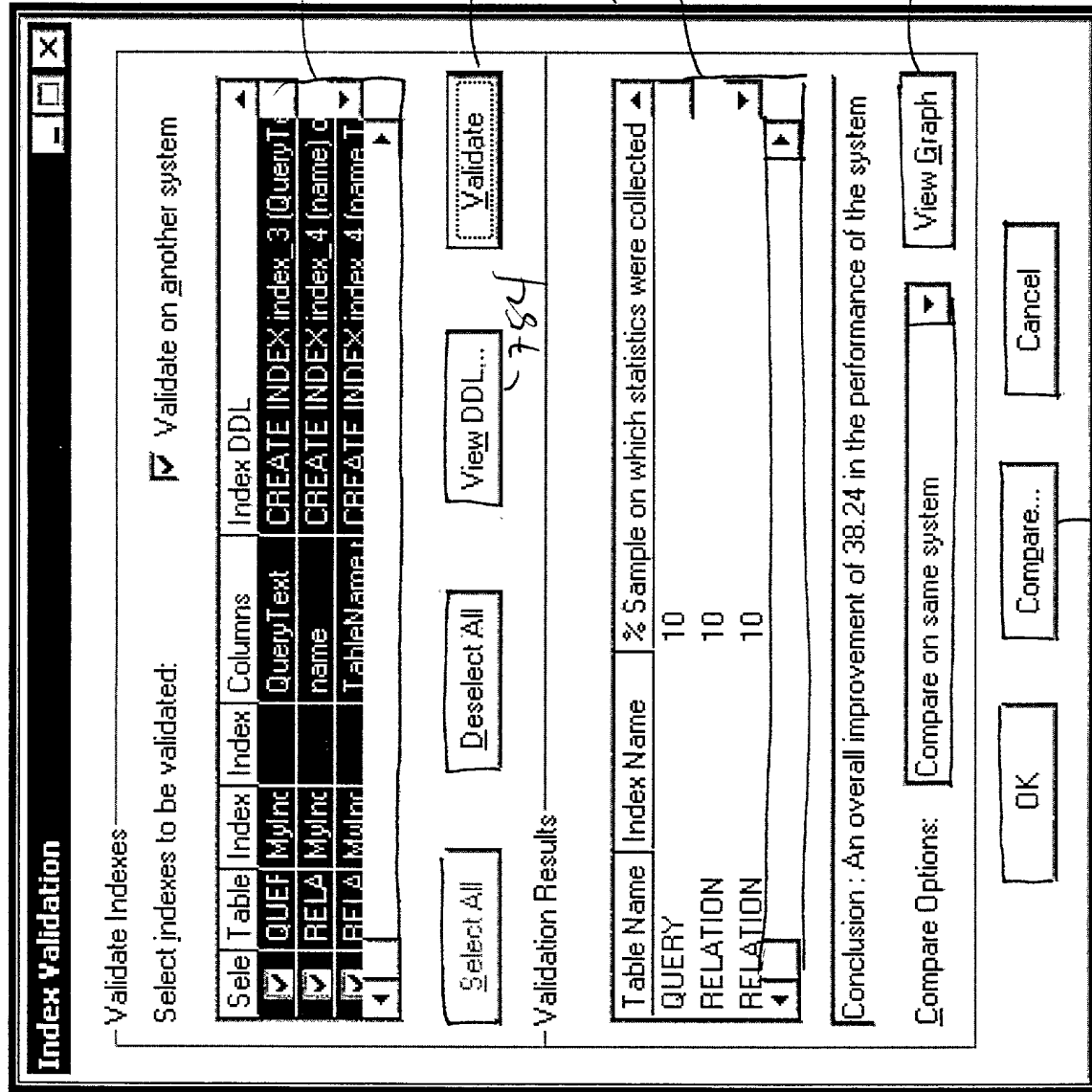


Fig. 44

762

FIG. 45

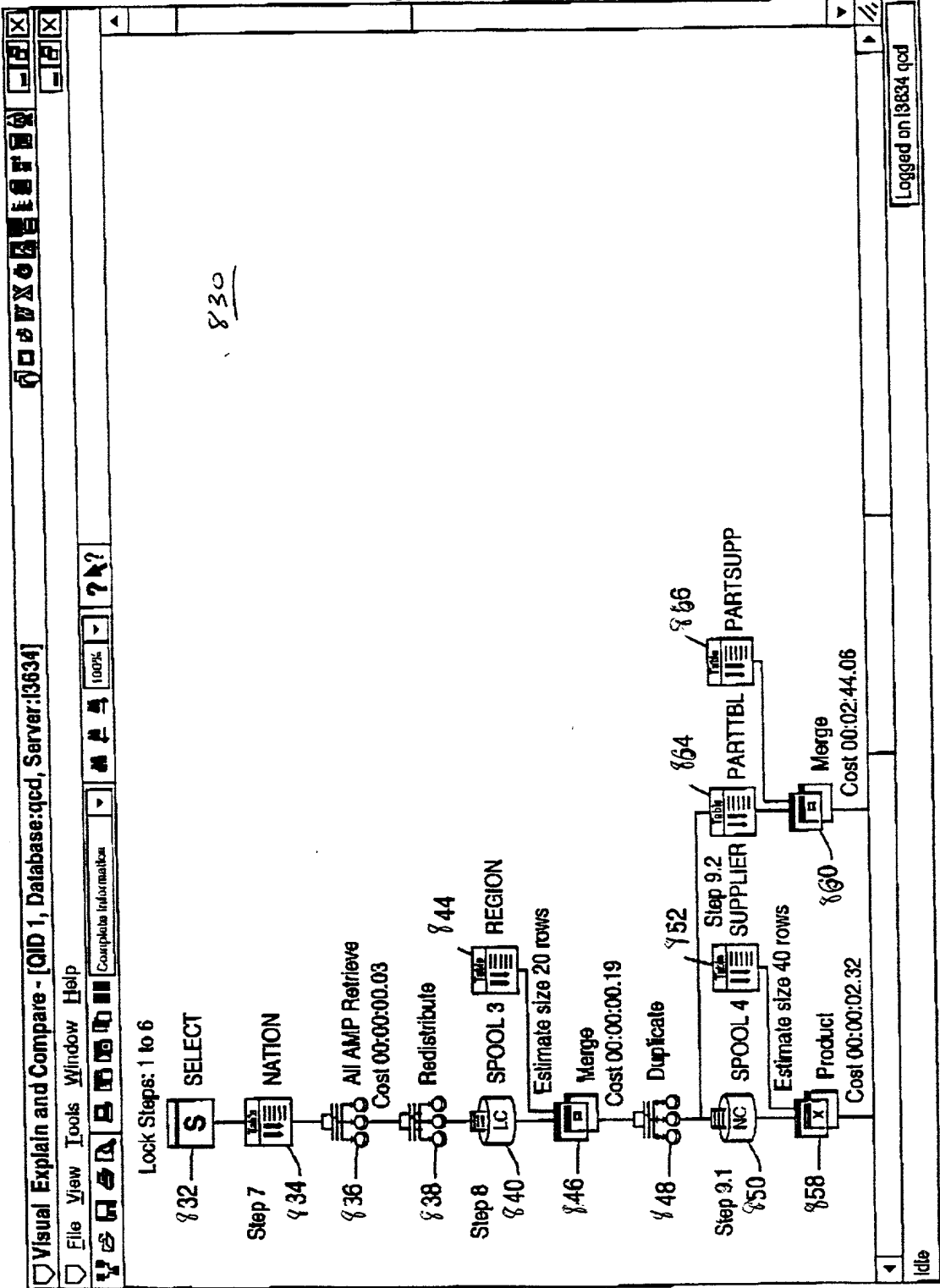
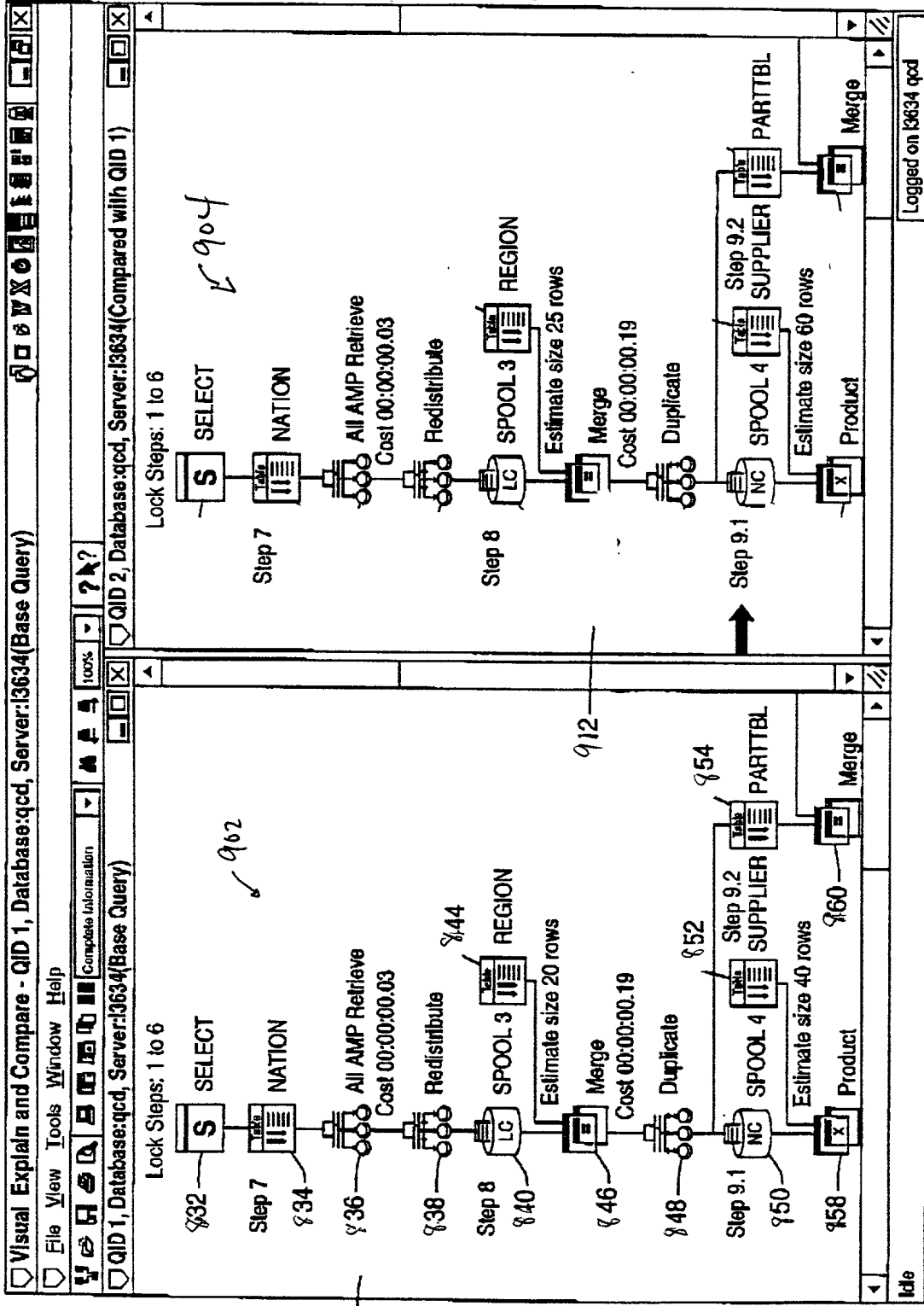


FIG. 46



Set Statistics Sample Size

Workload Definition

Validation

Up To 1,000 rows:	50
1,000 To 10,000 rows:	30
10,000 To 100,000 rows:	20
100,000 To 1,000,000 rows:	10
1,000,000 To 10,000,000 rows:	5
10,000,000 To 100,000,000 rows:	1
Above 100,000,000 rows:	0.1

Set Defaults

OK

Cancel

Apply

950

Define the workload or select the what-if analysis or start the index validation

Idle

QCD: TWIZQCD

Logged on to dpbv0, dbc

2:43 PM

Fig. 47